

PRECIPITATION.

(Expressed in inches and hundredths.)

The distribution of rainfall over the United States and Canada, as determined from observations taken at more than six hundred stations, is exhibited on chart iii. The table in the lower left-hand corner of this chart shows the average monthly rainfall, determined from the records of Signal Service stations, in the several districts, and the excess or deficiency as compared with the average of many years.

There has been an excess of rainfall in the south Atlantic states and in Florida, of 1.36 and 0.48, respectively. In the upper lake region and from the Mississippi westward to the Pacific coast, except in the northern slope, Rio Grande valley, and the southern plateau (where there have been deficiencies of 0.25, 0.65, and 0.89, respectively), the rainfall has been above the October average. The largest excess, 4.25, is reported from the north Pacific coast region. In the south Pacific coast region, the excess amounts to 0.10; in the middle Pacific coast region, to 1.86; and in the northern and middle plateau districts, to 1.23 and 0.97, respectively. From the west Gulf states and the southern slope, northward to the extreme northwest, the excesses vary from 0.72 to 1.41. Only a slight excess is reported from the upper lake region. From the east Gulf states, northeastward to New England, except along the south Atlantic coast and in Florida, deficiencies ranging from 0.46 to 1.75 are reported; they are greatest in the Ohio valley and Tennessee, and in the lower lake region. In New England, the middle Atlantic, and east Gulf states, the deficiencies vary from 0.46 to 0.59. On the summit of Pike's Peak, the monthly rainfall was 0.40, or 1.45 below the October average. On the summit of Mount Washington, the monthly rainfall was 6.19, which is 0.55 below the October average.

DEVIATIONS FROM AVERAGE PRECIPITATION.

Under this heading, departures exhibited by the regular Signal Service stations, are shown in the table of comparative monthly rainfalls, as published in the lower left-hand corner of chart iii. The following items of interest in connection with this subject are reported by voluntary observers:

Illinois: Riley, monthly rainfall, 4.17, or 1.68 above the October average of the last twenty-one years, and has been exceeded during that period only in 1877, 1878, and 1881. Anna, monthly rainfall, 2.06, or 2.21 below the October average of the last seven years.

Indiana: Logansport, monthly rainfall, 3.07, or 0.55 above the October average of the last twenty-three years. During that period, the largest October rainfall, 6.98, occurred in 1877; the smallest, 0.78, occurred in 1872. Saint Meinrad, monthly rainfall, 2.17, or 0.62 below the October average of last seven years.

Iowa: Clinton, monthly rainfall, 2.69, or slightly below the October average.

Kansas: Lawrence, monthly rainfall, 3.08, or 0.45 above the October average of the past fourteen years. During that period, the largest October rainfall, 6.96, occurred in 1870; the smallest 0.44, occurred in 1878. The total precipitation for the ten months ending October 31, 1882, is 24.26, or 6.76 below the mean of the corresponding months of the past fourteen years. Wellington, monthly rainfall, 6.32, or 3.13 above the October average of the past three years.

Maine: Gardiner, monthly rainfall, 2.02, or 2.48 below the October average of the past forty-six years.

Maryland: Fallston, monthly rainfall, 0.79, or 2.80 below the October average of the past twelve years. During that period, the largest October rainfalls, 7.56 and 7.70, occurred in 1873 and 1877, respectively; the least, 0.23 and 0.76, occurred in 1874 and 1879, respectively.

New Hampshire: Grafton, monthly rainfall, 1.06, or 2.25 below the October average of the past three years, and is the smallest monthly rainfall that has occurred during that period.

New York: Palermo, monthly rainfall, 0.30, or 3.30 below the October average of the past twenty-nine years. During

that period, the largest October rainfall, 7.90, occurred in 1862; the smallest is that of the present year. North Volney, monthly rainfall, 1.20, or 2.84 below the October average of the past ten years, and is the smallest for any October during that period; the largest October rainfall, 6.20, occurred in 1872; the smallest, 1.85, (with the exception of October, 1882), occurred in 1879.

Virginia: Wytheville, monthly rainfall, 1.10, or 1.90 below the October average of a period of eighteen years. The total precipitation for the ten months ending October 31, 1882, is 46.59, or 10.00 above the average of the corresponding months of eighteen years. Variety Mills, monthly rainfall, 1.52, or 1.31 below the average of the past four years. During that period, the largest October rainfall, 4.56, occurred in 1878; the smallest, 1.00, occurred in 1880.

West Virginia: Helvetia, monthly rainfall, 1.30, or 2.00 below the October average of the past six years.

The following table shows the greatest and least numbers of rainy and cloudy days, and percentages of mean relative humidity, as reported from the various districts:

Table of rainy and cloudy days and relative humidity for October, 1882.

Districts.	Rainy days	Cloudy days.	Relative humidity.*
	From 7 to 14	From 3 to 13	Percentages.
New England.....	7 to 16	7 to 11	From 71.1 to 79.3.
Middle Atlantic states.....	7 to 16	7 to 11	68.4 to 83.8.
South Atlantic states.....	7 to 13	5 to 9	72.4 to 88.0.
Florida peninsula.....	8 to 13	4 to 7	75.8 to 79.1.
East Gulf states.....	6 to 12	3 to 7	71.1 to 80.5.
West Gulf states.....	7 to 12	1 to 7	74.3 to 83.4.
Rio Grande valley.....	5 to 10	4 to 8	63.5 to 71.4.
Ohio valley and Tennessee.....	7 to 13	2 to 8	65.5 to 78.9.
Lower lake region.....	8 to 14	2 to 7	69.4 to 74.0.
Upper lake region.....	8 to 9	3 to 14	71.1 to 76.8.
Extreme northwest.....	11 to 14	5 to 12	72.8 to 80.3.
Upper Mississippi valley.....	7 to 15	4 to 13	66.2 to 76.8.
Missouri valley.....	5 to 12	4 to 8	62.8 to 74.9.
Northern slope.....	1 to 16	1 to 11	44.7 to 66.2.
Middle slope.....	2 to 7	1 to 5	46.7 to 81.7.
Southern slope.....	1 to 9	0 to 5	65.6 to 78.4.
Southern plateau.....	0 to 2	0 to 1	30.3 to 43.8.
Middle plateau.....	5 to 13	1 to 12	46.9 to 59.4.
Northern plateau.....	10 to 23	8 to 18	68.2 to 80.4.
North Pacific coast region.....	21 to 25	14 to 19	78.3 to 85.0.
Middle Pacific coast region.....	8 to 14	2 to 7	65.3 to 89.4.
South Pacific coast region.....	1 to 8	0 to 2	36.7 to 71.0.

* Relative humidity corrected for altitude.

Table of Excessive, Greatest and Least Monthly Rainfalls.

STATION.	SPECIAL HEAVY.			Largest Monthly.	SMALLEST MONTHLY.	
	Date.	Amt.	Duration	Amount.	STATION.	Amt.
Alabama.					Alabama.	
Mobile.....	31	5.20	5 hrs.	8.29	Talladega.....	0.29
Tuscaloosa.....	19	3.10			Calera.....	0.37
Birmingham.....	19	2.30			Arizona.	
Arkansas.					Casa Grande.....	0.00
Little Rock.....	28, 29	2.97		6.05	Benson.....	0.00
Russellville.....				6.89	Maricopa.....	0.00
Mount Ida.....				6.05	Fort Grant.....	0.00
Canada.					Fort Bowie.....	0.10
Halifax N. S.....				9.13	Pantano.....	0.00
Yarmouth, N. S.....				7.24	San Carlos.....	0.00
California.					San Simon.....	0.00
Summit.....				12.95	Tucson.....	0.00
Fort Gaston.....				9.02	Willcox.....	0.00
Visco.....				8.29	Fort Apache.....	0.00
Emigrant Gap.....				7.95	Yuma.....	0.01
Alta.....				7.65	Texas Hill.....	0.05
Waugh's Ferry.....				6.50	Phoenix.....	0.10
Florida.					Fort Verde.....	0.25
Fernandina.....	20, 21	13.14		17.17	Prescott.....	0.39
Saint Augustine.....	20 to 23	11.54	64 hrs.	12.71	California.	
Jacksonville.....	20, 21, 22	7.62		10.30	Indio.....	0.00
Mayport.....	20 to 23	7.66		9.07	Mojave.....	0.00
Fort Barrancas.....	18	2.05	5 hrs. 3 m.	8.17	Whitewater.....	0.00
Do.....	19	2.28	6 hrs.		Fresno.....	0.05
Live Oak.....	11	4.75		7.64	Los Angeles.....	0.05
Cedar Keys.....	10, 11	3.50			Havenna.....	0.12
Pensacola.....	13	2.01	5 hrs. 35 m.		Newhall.....	0.16
Georgia.					Kingsburg.....	0.19
Way Cross.....	11	2.72		6.34	Anaheim.....	0.26
Jesup.....	11	2.78			San Fernando.....	0.23
Quitman.....	11	2.70			Poway.....	0.29
Albany.....	20	2.60			San Diego.....	0.41
Eastman.....	20, 21	3.99			Napa.....	0.44
Allapaha.....	21	5.00			Solidad.....	0.46
Kansas.					Colton.....	0.50
Wellington.....	7	4.18		6.32	Mammoth Tank.....	0.50
Creswell.....	7	3.29		6.15	Colorado.	
Argyle.....				6.23	Pagosa Springs.....	0.00
Levy.....				6.30		

Table of Excessive, Greatest and Least Monthly Rainfalls—Continued.

STATION.	SPECIAL HEAVY.			Largest Monthly. Amount, Inches.	SMALLEST MONTHLY. Amount, Inches.
	Date.	Amt.	Duration		
Milan.....				6.15	Fort Lewis.....0.20
Pretty Prairie.....				6.15	Fort Lyon.....0.30
Louisiana.....					West Las Animas...0.25
Shreveport.....	17, 18	4.17		6.72	Fort Garland.....0.30
Monroe.....	18	3.07			Pike's Peak.....0.40
Alexandria.....	18	2.62			Dakota.....
Massachusetts.....					Smithville.....0.12
Somerset.....	14	4.54	9 hrs.	6.20	Fort Sul y.....0.14
Provincetown.....	14	2.19	8 hrs.		Georgia.....
Michigan.....					Bainbridge.....0.32
Northport.....				7.63	Maryland.....
Mississippi.....					Fort McHenry.....0.26
Vicksburg.....	18	2.09			Ocean City.....0.42
Missouri.....					Massachusetts.....
Pierce City.....				9.50	Rowe.....0.25
Clinton.....				7.61	Williamstown.....0.32
Springfield.....				7.62	Mississippi.....
Protom.....	2	1.50	1hr.35m.	7.22	Meridian.....0.20
Nebraska.....					Montana.....
Nebraska City.....				7.07	Fort Custer.....0.28
Minden.....				6.10	Terry's Landing.....0.49
New Hampshire.....					Nebraska.....
Mount Washington.....				6.19	Red Willow.....0.12
New Jersey.....					Nevada.....
Barnegat.....	14	2.05			Wadsworth.....0.16
North Carolina.....					New Mexico.....
Smithville.....	11, 12	7.38		9.45	Deming.....0.00
Hatteras.....	11, 12	7.04		9.03	Fort Union.....0.00
Wilmington.....	11, 12	4.68		7.57	Fort Wingate.....0.00
Do.....	2	2.17			Lordsburg.....0.00
Portsmouth.....	11, 12	5.70		6.89	Fort Hayard.....0.00
Fort Macon.....	11, 12	5.26		6.32	Santa Fé.....0.00
New River Inlet.....	11, 12	4.30		6.15	New York.....
Charlotte.....	19, 20	3.14		6.13	Albany.....0.27
Sloop Point.....	11, 12	4.37			Palermo.....0.30
Oregon.....					Oswego.....0.50
Portland.....	10	2.93		11.63	Texas.....
Eola.....				7.61	El Paso.....0.00
Albany.....				7.07	Wyoming.....
Rhode Island.....					Cheyenne.....0.31
Newport.....	14	2.95			
Block Island.....	14	2.26			
South Carolina.....					
Charleston.....	11	4.27	10hr.15m.	6.56	
Hardeeville.....	10, 11	3.98			
Columbia.....	20, 21	3.28			
Jacksonboro.....	21	3.00			
Texas.....					
Palestine.....	12	1.79	2 hrs.	9.96	
Do.....	18, 19	4.35	12hr.45m.		
Huntsville.....	6, 7, 8	5.07		8.62	
Dallas.....	16	4.45		7.32	
Tyler.....	18	2.16		7.16	
Galveston.....	18	2.59		6.79	
San Antonio.....	8	1.70	1hr.10m.		
Houston.....	15, 16	3.16			
Virginia.....					
Cape Henry.....	24	2.68		7.25	
Norfolk.....				6.67	
Washington Territory.....					
Colfax.....				6.81	

HAIL.

The most destructive hail storm of the month passed over eastern Iowa on the afternoon of the 30th, being most destructive in the vicinity of Davenport. A description of this storm is given under LOCAL STORMS. At Davenport, the fall of hail began at 3.21 p. m. and lasted six minutes. During this time, hailstones of various sizes and irregular shapes fell, breaking nearly all of the sky-lights in the city. Pieces of ice were picked up which measured as much as eight and one-half inches, with a thickness of one and a half inches. Hailstones as large as these again fell from 3.40 to 3.43 p. m. This storm is considered to have been the severest that has ever visited this locality.

Burlington, Iowa, 30th: About 5.00 p. m., a terrific hail storm passed over this place. The hailstones were very large; one of them was found to measure five and one-quarter inches in circumference.

Rock Island, Illinois, 30th: A destructive hail storm occurred at 3.30 p. m., lasting ten minutes. The hailstones were very large.

Lincoln, Nebraska, 6th: A heavy storm occurred here at 6.30 p. m., accompanied by hail and lightning, which is a very remarkable occurrence for this season.

Red Bluff, California, 1st: During the storm of this date, hailstones measuring one inch in diameter fell, completely covering the ground.

Fort Supply, Indian Territory: During the night of the 11th-12th, a heavy rain and hail storm occurred twenty miles north of this place.

Hail storms of less violence have been reported as follows:

Arkansas: Little Rock, 12th.

California: Alcatraz Island, 2d.

Dakota: Fort Sully, 3d; Fort Lincoln, 15th, 17th; Fort Yates, 15th.

Illinois: Morrison, 30th.

Iowa: Dubuque, 30th.

Indian Territory: Fort Reno, 7th; Fort Supply, 7th.

Idaho: Lewiston, 14th; Eagle Rock, 16th.

Michigan: Escanaba, 12th; Northport, 29th.

Missouri: Protom, 12th; Pierce City, 28th; Clinton, 27th, 28th, 30th.

New Jersey: Moorestown, 27th.

Oregon: Portland, 10th; Albany, 13th.

Pennsylvania: Fallsington, 27th.

Utah: Coalville, 3d; Salt Lake City, 8th, 12th.

Washington Territory: Dayton, 14th, 30th.

Wisconsin: Madison, 30th.

SNOW.

Snow fell in the various states and territories as follows:

California: Fort Bidwell, 2d, 3d, 4th, 12th, 14th.

Colorado: Fort Garland, 11th, 17th; Fort Lewis, 10th; Pagosa Springs, 11th; West Las Animas, 17th, 18th; Denver, 11th, 17th, 30th; Pike's Peak, 6th, 7th, 8th, 14th, 15th, 17th, 26th.

Dakota: Fort Abraham Lincoln, 15th, 28th, 29th; Fort Sisseton, 31st; Fort Totten, 26th, 28th; Fort Meade, 15th, 17th; Rapid City, 15th; Fort Buford, 26th; Bismarck, 15th, 30th; Fort Stevenson, 15th, 26th, 29th; Tobacco Garden, 17th, 26th, 29th, 31st; Deadwood, 12th, 15th, 16th, 27th.

Idaho: Eagle Rock, 4th, 14th, 31st; Boise City, 30th.

Michigan: Marquette, 29th.

Minnesota: Fort Snelling, 21st; Duluth, 29th; Moorhead, 17th, 30th; Saint Vincent, 17th, 30th.

Montana: Cartersville, 1st, 2d, 3d, 31st; Fort Keogh, 31; Terry's Landing, 31st; New Chicago, 2d, 3d, 14th, 15th, 17th, 30th, 31st; Fort Ellis, 2d, 3d, 8th, 9th, 13th, 16th, 17th, 31st; Fort Shaw, 2d, 3d, 4th, 21st, 27th, 31st; Deer Lodge, 2d, 5th; Fort Assiniboine, 24th; Fort Benton, 2d, 31st; Fort Custer, 31st; Helena, 2d; Fort Missoula, 30th, 31st.

Nevada: Carson City, 2d, 3d, 5th, 12th, 30th; Winnemucca, 4th, 13th; Pioche, 14th.

New Hampshire: Mount Washington, 24th, 25th, 26th.

New Mexico: Santa Fé, 18th.

Utah: Fort Douglas, 4th, 9th, 12th, 14th; Salt Lake City, 4th, 14th, 15th, 31st.

Washington Territory: Colfax, 29th, 30th, 31st; Pomeroy, 30th, 31st; Dayton, 31st; Spangle, 30th, 31st.

Wyoming: Fort Bridger, 2d, 4th, 5th, 11th, 14th, 16th, 30th, 31st; Cheyenne, 6th, 9th, 17th; Fort Washakie, 14th, 15th.

LARGEST MONTHLY SNOWFALL.

[Expressed in inches.]

The following are the largest monthly snowfalls reported during the month:

Summit, California, 27 $\frac{1}{2}$; Cisco, California, 13 $\frac{1}{2}$; Wells, Nevada, 10 $\frac{3}{4}$; Coalville, Utah, 9 $\frac{1}{2}$; Otego, Nevada, 8 $\frac{3}{4}$; Toano, Nevada, 7 $\frac{3}{4}$; Emigrant Gap, California, 6; Promontory, Utah, 3 $\frac{1}{2}$; Halleck, Nevada, 3.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF THE MONTH.

[Expressed in inches.]

Saint Vincent, Minnesota, 2; Fort Custer, Montana, 2; Helena, Montana, $\frac{1}{2}$; Fort Shaw, Montana, $\frac{1}{2}$. On the summits of Pike's Peak, Colorado, and Mount Washington, New Hampshire, trace.

SLEET.

Cheyenne, Wyoming, 9th; Fort Ellis, Montana, 11th; Colfax, Washington Territory, 14th.